The Art of Measuring. Knick

User Manual
English

Ceramat WA 153
Sensor Lock-Gate

Latest Product Information: www.knick.de

Warranty
Defects occurring within 1 year from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender).
©2014 Subject to change without notice

Exclusions from warranty
Wear parts (gaskets) and damage caused by improper use are excluded from warranty.

Return of products
Please contact our Service Team before returning a defective device. Ship the cleaned device to the address you have been given. If the device has been in contact with process fluids, it must be decontaminated/ disinfected before shipment. In that case, please attach a corresponding Declaration of Contamination (see page 39), for the health and safety of our service personnel.

Trademarks
The following trademarks are used in this manual without further marking:
Ceramat®, Protos®, Unical®, Uniclean®
are registered trademarks of Knick Elektronische Messgeräte GmbH & Co. KG, Germany

Safety Information

NOTICE
Process-related risks
Knick Elektronische Messgeräte GmbH & Co. KG assumes no liability for damages caused by process-related risks known to the operator, which would in fact not permit the use of the sensor lock-gate.

⚠ WARNING
Always make sure that the sensor lock-gate cannot be activated by other persons during servicing or installation (e.g. cleaning or replacing the sensor). During operation the drive unit of the Ceramat sensor lock-gate is rotating rather quickly by 140°. **There is a risk of injury!** **Be sure to observe:** Work on the sensor lock-gate must only be performed by personnel authorized by the operating company and specially trained for handling and operating the sensor lock-gate.

Note:
Supplementary information is provided in the Ceramat Maintenance Instructions
(Maintenance / Spare Parts / Accessories)

Table of Contents

Safety Information **3**
Table of Contents **4**
Intended Use **5**
Rating Plates 6
Package Contents **7**
Product Coding **8**
Function Description **10**
Composition of the Sensor Lock-Gate **11**
Information on Installation **13**
Connection to Unical or Uniclean **17**
Installing/Removing a Sensor **18**
pH Sensors 19
Sensor Dismount Guard 19
Installing/Removing a Solid-Electrolyte Sensor **20**
pH Sensors, Oxygen Sensors, Conductivity Sensors 20
Installing/Removing a Liquid-Electrolyte Sensor **21**
pH Sensors 21
Cavity Rinsing Function **23**
Maintenance Work on the Drive Unit **24**
Removing the Drive Unit **25**
Installing the Drive Unit **26**
Installation Dimensions **27**
Solid Electrolyte 27
Liquid Electrolyte 28
Process Adaptations and Immersion Depths (Examples) 29
Specifications **30**
Maintenance Intervals **31**
Lubricants, O-Rings **32**
Sealing Kits for Maintenance and Servicing **33**
Accessories / Spare Parts **34**
Declaration of Contamination **39**
Index **40**

Intended Use

5

The Ceramat pneumatic sensor lock-gate with ceramic sealing is used for installing a sensor for measuring process variables in liquid media. The sensor can be cleaned, calibrated, or replaced under process conditions (pressure and temperature).
Since the pneumatic drive unit and the process unit with the ceramic sensor lock-gate are separate modules, the drive unit can be removed and replaced under process conditions.

The sensor lock-gate is suitable for sensors with an outer diameter of 12 mm, for sensors:
- **with solid electrolyte, length 225 mm, sensor head with PG 13.5**
- **with liquid electrolyte, length 250 mm**

- **for optical sensors with a body diameter of 12 mm or 12.7 mm (1/2“)**
  (For installing an optical sensor, you require a special adapter which is listed in the Product Coding under “Special version”. Information on design and use of the suitable adapter is provided in a supplementary datasheet.)

The Ceramat sensor lock-gate allows:
- inserting and retracting the sensor under process pressure (sensor lock-gate)
- calibrating or adjusting the measuring system and cleaning the sensor in the running process (different options available)
- removing or replacing the sensor after separation from the process (in SERVICE position)

The Ceramat sensor lock-gate has been developed and manufactured in compliance with the applicable European guidelines and standards. Compliance with the European guidelines and standards is confirmed by the EC Declaration of Conformity. Compliance with the European Harmonized Standards for use in hazardous locations is confirmed by the EC-Type-Examination Certificate. To ensure smooth performance of the measuring points with the Ceramat, a number of important operating and maintenance parameters must be complied with (see Ceramat Maintenance Instructions).
There is no particular direct hazard caused by the operation of the device in the specified environment.

⚠ CAUTION

Safe use
- If you are not sure whether the sensor lock-gate can be safely used for your intended application, please contact the manufacturer.
- Take account of the influences of humidity, ambient temperature, chemicals and corrosion.
- To ensure safe use of the equipment, you must follow the instructions given in this manual and observe the specified temperature and pressure ranges.

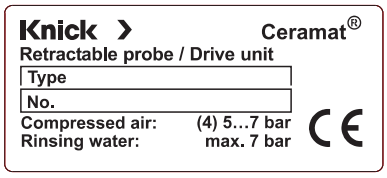
⚠ WARNING

Application in hazardous locations
For hazardous-area applications, the sensors used must ensure proper separation of the ATEX zones. When the sensor lock-gate is in SERVICE position, the sensor may be replaced within a Zone 1 hazardous location.

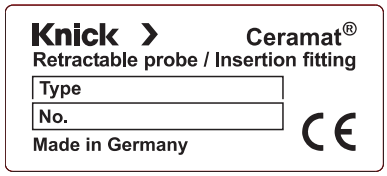
Rating Plates

Ceramat WA 15x-N

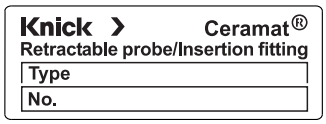
Drive

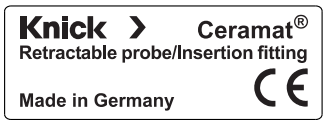


Process



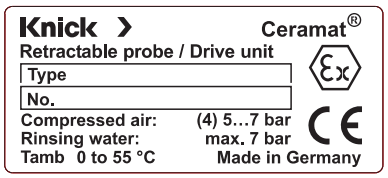
Process, small rating plates



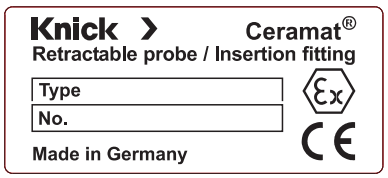


Ceramat WA 15x-X

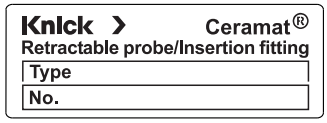
Drive

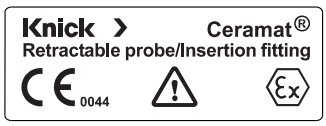


Process



Process, small rating plates





Package Contents

7

Check the shipment for transport damage and completeness.

The package should contain:

- Sensor lock-gate
- Documentation
- Test certificates

WA 153- □□□□□□ – □□□□□□□ – □□

Explosion protection	For hazardous area Zone 1	X
	Without	N
Sensor	Sensor, Ø 12 mm with PG 13.5	0
	pH sensor, Ø 12 mm, pressurized	1
	Optical sensor, Ø 1/2" (12.7 mm)	2
	Optical sensor, Ø 12 mm	3
Material of gaskets	FKM (Viton)	A
	EPDM	B
	EPDM FDA	E
	FKM FDA	F
	FFKM FDA	H
	FFKM	K
Material of sensor protection sleeve	*Hastelloy C22*	B
	PEEK	E
	1.4404	H
	Titanium	T
Material of sensor socket	Hastelloy C 22, without protection	B 0
	Hastelloy C 22, short protection	B 1
	1.4404, without protection	H 0
	1.4404, short protection	H 1
	1.4404, long protection	H 2
	1.4404, full protection	H 3
	PEEK, without protection	E 0
	Titanium, without protection	T 0
	Titanium, short protection	T 1
Scraper for sensor socket	Without	0
	PEEK, natural	1
Immersion depth	Special immersion depth 26 - 104 mm (increase in 1 mm steps)	0 0 1
	Immersion depth 105 mm (max.)	0 0 5
Process-wetted material	*Hastelloy C22*	B
	1.4404	H
	Titanium	T
Process adaptation	Flange, 1.4571 steel, PN10/16, DN 50, loose	B 1
	Flange, 1.4571 steel, PN10/16, DN 65, loose	B 2
	Flange, 1.4571 steel, PN10/16, DN 80, loose	B 3
	Flange, 1.4571 steel, PN10/16, DN 100, loose	B 4
	Flange, 1.4571 steel, PN10/16, DN 125, loose	B 5
	Flange, 1.4571 steel, PN10/16, DN 150, loose	B 6
	Flange, 1.4571 steel, PN10/16, DN 200, loose	B 7
	Flange, 1.4571 steel, PN40, DN 50, loose	E 1
	Flange, 1.4571 steel, PN40, DN 65, loose	E 2
	Flange, 1.4571 steel, PN40, DN 80, loose	E 3
	Flange, 1.4571 steel, PN40, DN 100, loose	E 4
	Flange, 1.4571 steel, PN40, DN 125, loose	E 5

WA 153- [ ][ ][ ][ ][ ][ ]–[ ][ ][ ][ ][ ][ ][ ]–[ ]

	Flange, 1.4571 steel, PN40, DN 150, loose	E	6		
	Flange, 1.4571 steel, PN40, DN 200, loose	E	7		
	Dairy pipe DN 50	C	1		
	Dairy pipe DN 65	C	2		
	Dairy pipe DN 80	C	3		
	Dairy pipe DN 100	C	4		
	Flange, ANSI 316,150 lbs, 2″	D	1		
	Flange, ANSI 316, 150 lbs, 2 1/2″	D	2		
	Flange, ANSI 316, 150 lbs, 3″	D	3		
	Flange, ANSI 316, 150 lbs, 3.5″	D	4		
	Flange, ANSI 316, 150 lbs, 4″	D	5		
	Flange, ANSI 316, 150 lbs, 5″	D	6		
	Flange, ANSI 316, 150 lbs, 6″	D	7		
	Flange, ANSI 316, 300 lbs, 2″	P	1		
	Flange, ANSI 316, 300 lbs, 2 1/2″	P	2		
	Flange, ANSI 316, 300 lbs, 3″	P	3		
	Flange, ANSI 316, 300 lbs, 3.5″	P	4		
	Flange, ANSI 316, 300 lbs, 4″	P	5		
	Flange, ANSI 316, 300 lbs, 5″	P	6		
	Flange, ANSI 316, 300 lbs, 6″	P	7		
	Clamp 2"	J	2		
	BioControl, 1.4404, DN 65	L	2		
	Varivent, 1.4404 (≥ DN 50)	V	1		
	Special flange, to customer requirements	S	0		
Probe guard	Without			0	
	With, version 1			1	
Special version	Without				000
	Equipped with special grease (provided by customer)				1
	Sensor protection sleeve for optical sensor with Ø 1/2″ (12.7 mm) for RAMAN probe, with additional anti-twist protection for the sensor cables, adapter, rotating, 1/2″/PG 13.5 (according to drawing)				7
	Sensor protection sleeve for optical sensor with Ø 1/2 mm, with additional anti-twist protection for the sensor cables, adapter, rotating, 12 mm/PG 13.5 (according to drawing)				B
	Ceramat, inlet and outlet made of PEEK				D
	Additional radial sealing on the front face of the process unit, for Ø 50 mm bore with O-ring (material according to sealing kit)				E
	Customer-specific special datasheet				F

Entries shown in italics are special options, delivery time on request

10 Function Description

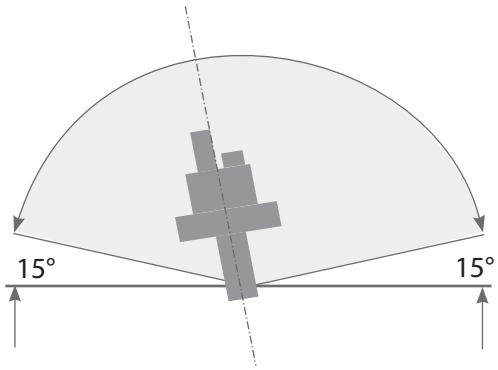
The pneumatically operated sensor lock-gate allows calibrating or adjusting the measuring system and cleaning the sensor in the running process. For that purpose, the sensor can be moved between two positions:

PROCESS position: The sensor is located in the process medium.
SERVICE position: The sensor is located in the calibration chamber.

In SERVICE position the measuring system can be calibrated or adjusted or the sensor can be cleaned.
Using compressed air, a control unit such as the Unical 9000 moves the sensor between SERVICE position and PROCESS position and leads different calibration and/or cleaning liquids to the sensor located in the calibration chamber.
These liquids leave the calibration chamber through an outlet hose, i.e. they are displaced from the calibration chamber by following liquids or by compressed air.
To replace the sensor, you must move the sensor lock-gate into SERVICE position.
With the Unical 9000 probe controller, all media, control air, and the check-back cable for position indication of the probe are connected to the sensor lock-gate through a compact connector (multiplug).
Since the pneumatic drive unit and the process unit with the ceramic sensor lock-gate are separate modules, the drive unit can be removed and replaced under process conditions.

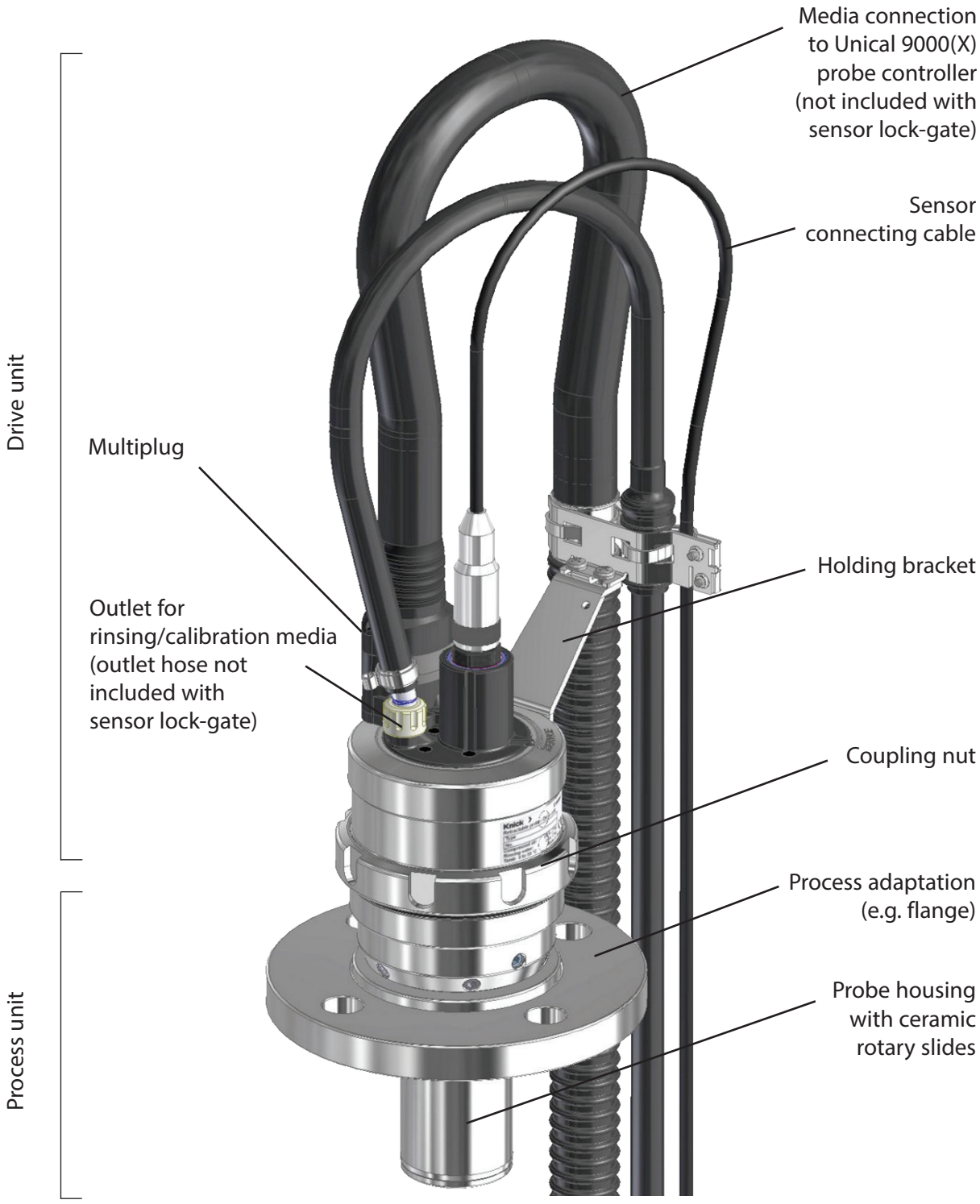
Mounting

- Possible mounting angle: 15° above horizontal.
- Mounting angle 360° (i.e. even upside down) for special sensors only containing thickened electrolytes which thus cannot flow.



Composition of the Sensor Lock-Gate

The Ceramat sensor lock-gate consists of 2 main units: drive unit and process unit.
The **drive unit** performs the movements required to open and close the ceramic rotary slide and to move the sensor into and out of the process.
The **process unit** comprises the ceramic sensor lock-gate with calibration chamber in the probe housing as well as the process adaptation (e.g., flange or dairy-pipe screw joint). Drive unit and process unit can be separated by the operator even under process pressure when certain safety precautions are taken (see "Maintenance Work on the Drive Unit" on page 24).

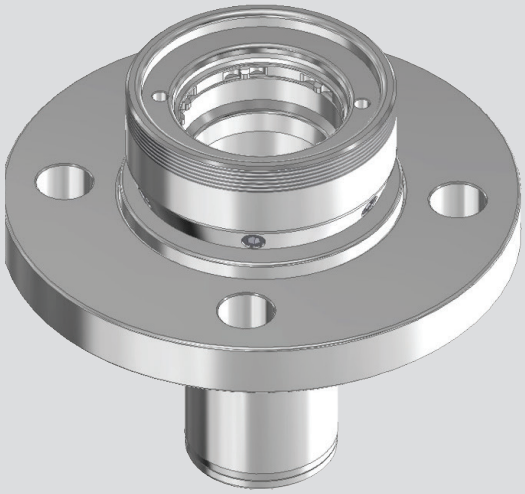

Media connection to Unical 9000(X) probe controller (not included with sensor lock-gate)
Sensor connecting cable
Drive unit
Multiplug
Holding bracket
Outlet for rinsing/calibration media (outlet hose not included with sensor lock-gate)
Coupling nut
Process adaptation (e.g. flange)
Process unit
Probe housing with ceramic rotary slides

Drive units

Drive unit for sensors with solid electrolyte

Drive unit for sensors with liquid electrolyte

Process adaptations (examples)



Flange

Dairy-pipe screw joint

Varivent

For operation of the Ceramat, you must connect control air, rinsing or calibration media, and the electrical check-back signal for indicating the probe position.
There are two basic options for this.

When the Ceramat is operated with a Unical or Uniclean electro-pneumatic controller and the Protos measuring system, the cables and tubings for air pressure, rinsing/calibration media and check-back are combined in a single hose with just one plug connection (multiplug). This hose is referred to as media connection.
This media connection is installed on the Ceramat together with the outlet hose.

When you do not use a probe controller (Unical or Uniclean and Protos measuring system), you can connect the supply lines for control air, rinsing/calibration media and electrical check-back to the Ceramat with a free hose connection via the ZU 0631 standard-media interface.

Connection for operation with
Unical/Uniclean und Protos

Connection for operation with
ZU 0631 standard media interface

Installing the outlet hose

Do not install the outlet hose more than 1 meter downwards (see figure 2).
Doing so raises the danger of air being sucked out of the calibration chamber due to the drop in pressure.
Leakage of the calibration chamber due to gravity alone is prevented by the loop in the outlet hose when the Ceramat is installed at an angle of up to 15° above the horizontal (see figure 1).

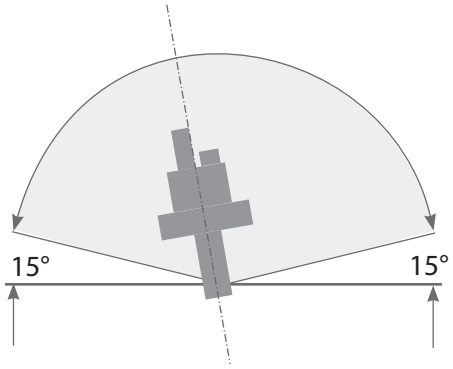


Fig. 1

With horizontal to upside-down installations, you must install an appropriate hose bend above the level of the calibration chamber to prevent leakage from the calibration chamber (see figure 2).

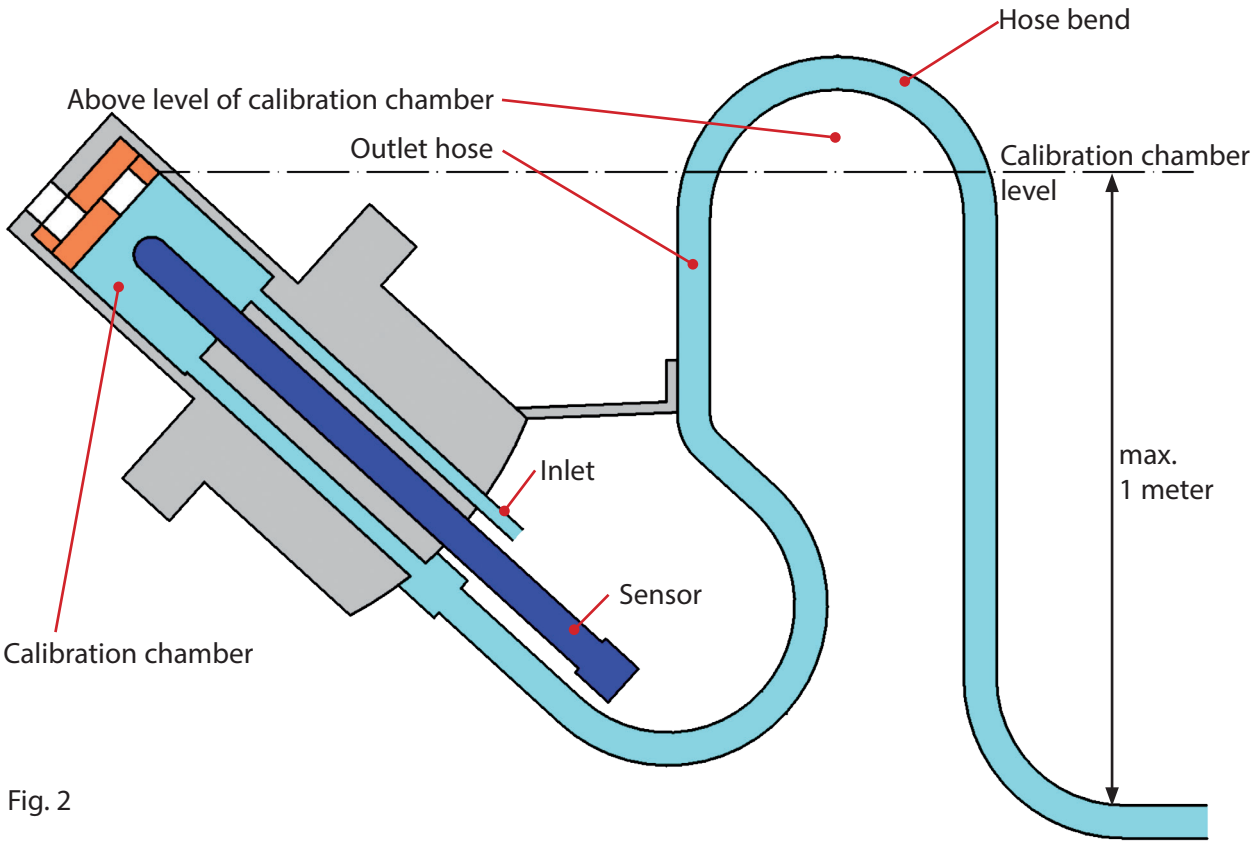
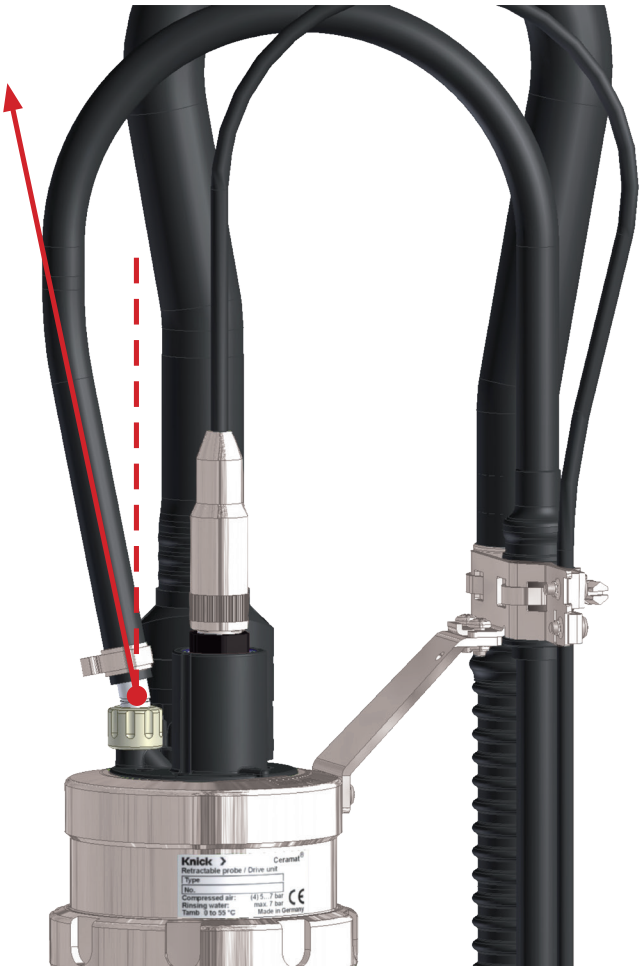
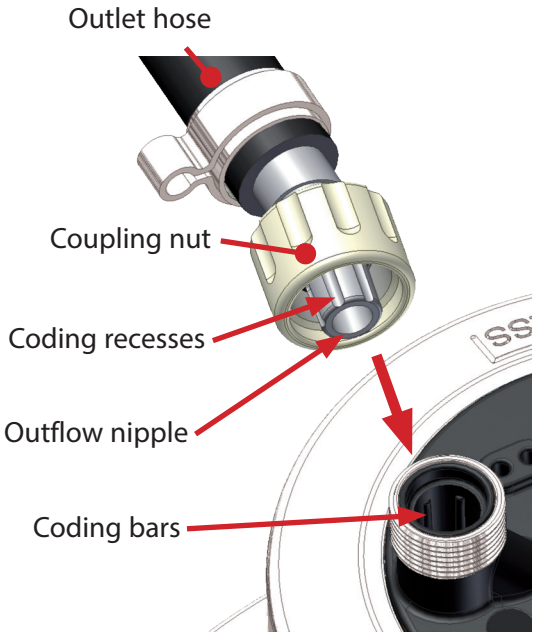


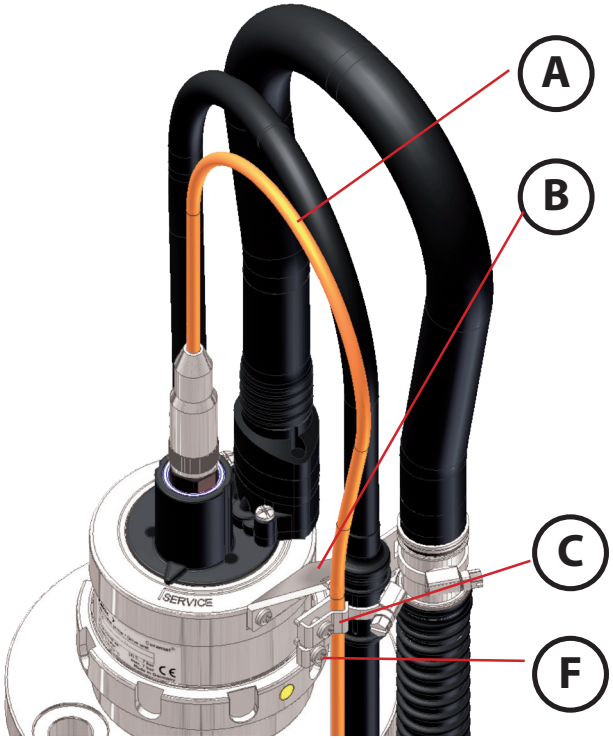
Fig. 2



Connecting the outlet hose
Turn the outflow nipple so that the outlet hose points outwards (see figure on the left). Before tightening the coupling nut, correctly align and insert the outflow nipple!

NOTICE
Check positioning of coding recesses and coding bars to lock the connection.

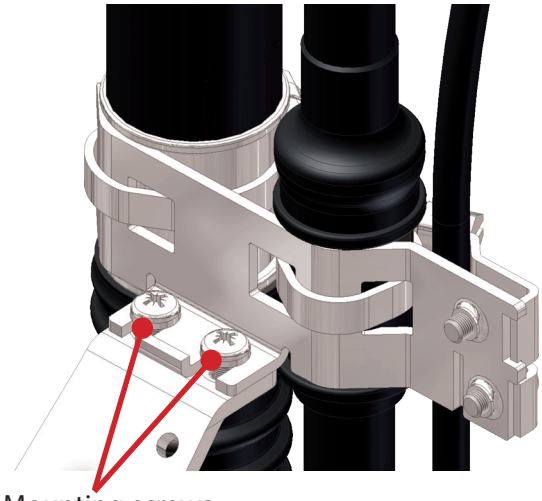




Installing the sensor cable
(pH, oxygen, and conductivity cables)
Attach the connecting cable **(A)** to the sensor and connect to the fixing bracket **(B)** in a loop as shown in the illustration.
Using clamp **(C)**, attach the cable lightly so that the cable is secured and not constricted. The rotational movement of the Ceramat would otherwise damage the cable.

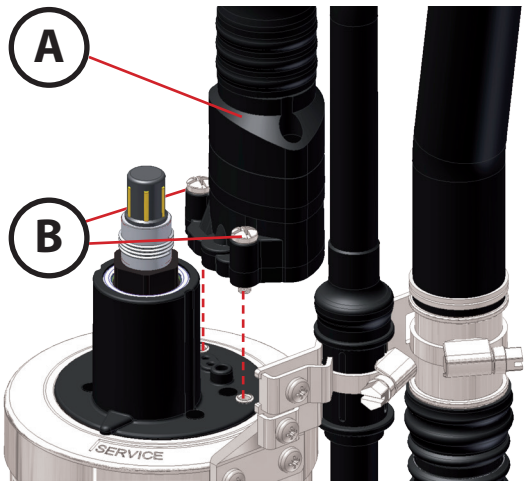
NOTICE
The cable loop must be long enough so that the cable does not impede the stroke movement of the fitting.

Connect equipotential bonding cable to terminal **(F)** (if required).



The following procedure is recommended for installing the media connection (also applies to installation of ZU 0631 standard-media interface):

Attaching the hose to the fixing bracket of the Ceramat
Attach the bracket of the media connection to the fixing bracket of the Ceramat with mounting screws.



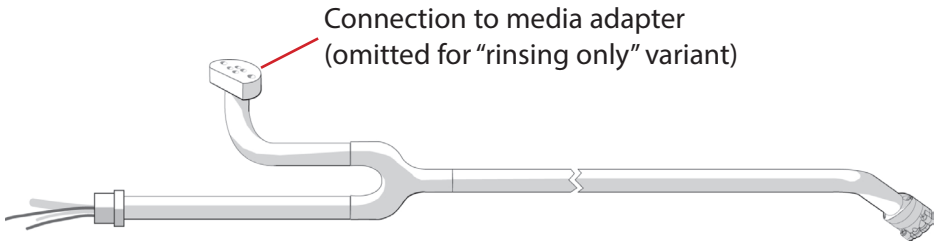
Connecting the multiplug
Connect multiplug **(A)** with 2 screws **(B)** as shown.

Connection to Unical or Uniclean

The media connection is available in 5 m, 10 m, 14 m, or 17 m length (other lengths on request).
It consists of a Ø 30 mm corrugated hose with a metal coil.
You can also order special lengths (also heated or with wall ducts).
2 variants are available:

- for rinsing only (without branch outlet to media adapter)
- for calibration and cleaning function (with branch outlet to media adapter)

Connections
The connections for media adapter and sensor lock-gate are of a plug-in design. They are mechanically fixed by screwing. Each fluid is fed to the sensor lock-gate through a separate tube of the media connection. Check valves in the multiplug minimize contamination and prevent mixing of the calibration fluids.



Connection to Unical 9000(X)
or Uniclean 900(X)

Multiplug for connecting the Ceramat

Connection to Unical or Uniclean
The corrugated hose is screwed to the joining piece of the Unical or Uniclean.
You can easily feed the different media tubes through the slit in the securing nut. The different tube lengths and diameters provide for a clear assignment to the different connection points (color coded).
See also Unical 9000(X) / Uniclean 900(X) installation manual.

Connection to media adapter
This connection is plugged and screwed to the media adapter. It includes the media tubing.
Electrical connection is made via a plug-in connector.
See also Unical 9000(X) / Uniclean 900(X) installation manual.

18 Installing/Removing a Sensor

NOTICE

Sensors must only be installed or removed by trained personnel authorized by the operating company.
The Ceramat sensor lock-gate must be in **SERVICE position**.
This position is attained by:

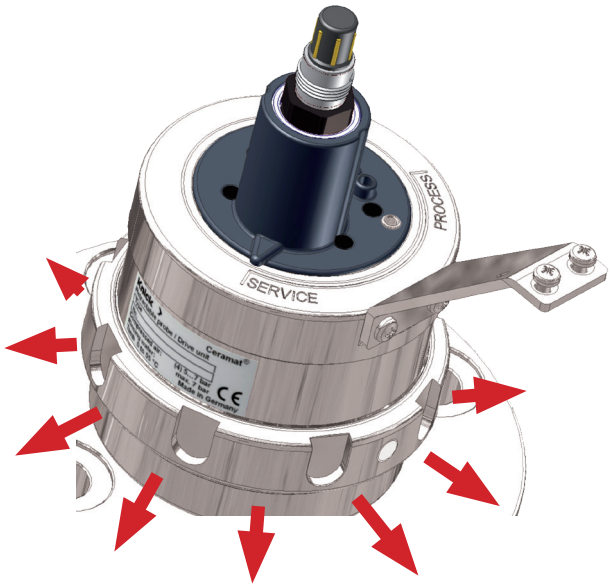
- the "Maintenance" menu when controlled by Protos 3400(X)
  (see user manual of PHU 3400(X)-110 module)
- the service switch (see Unical 9000(X) installation manual)

pH Sensors

Be sure to follow the assembly instructions step by step.

Preparations:

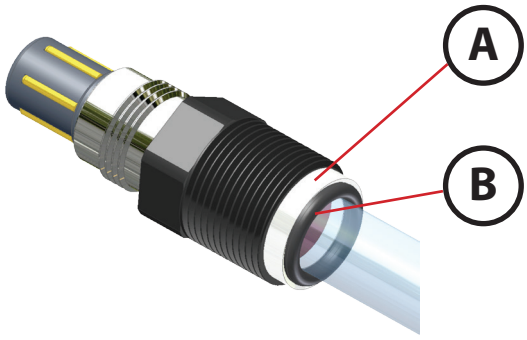
- Check whether the sensor is damaged (glass broken?).
  Never install a damaged sensor.
- Check whether slide washer or O-ring on the sensor are damaged and replace if required.
- Remove watering cap from the sensor tip and rinse sensor with water.



Sensor Dismount Guard

(only for sensors with solid electrolyte)

In conjunction with the Unical or Uniclean electro-pneumatic controllers and the Protos measuring system, the Ceramat is fitted with a sensor dismount guard. This serves to prevent the immersion of the sensor lock-gate without sensor (a message is triggered in the Protos). If the sensor is absent or incorrectly mounted, compressed air noticeably and audibly escapes from below the drive's coupling nut.
The outflowing compressed air is detected by a flow switch in the Unical and signals the missing or incorrectly mounted sensor to the Protos.



The sensor dismount guard only works with a correctly installed O-ring **(B)** and slip ring **(A)** on the sensor. If these elements are not present, the "Sensor dismounted" message is shown in the Protos display.
Before installing a new sensor, check whether there are any sealing elements at the bottom of the sensor holder from previous installations which have not been removed!

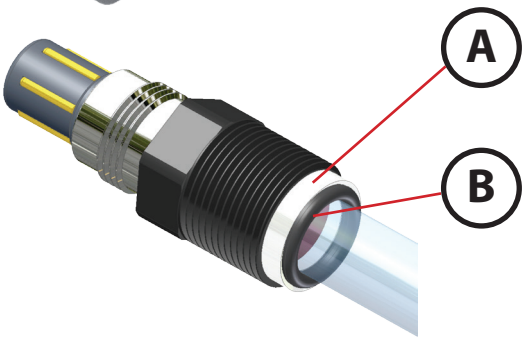
Note

When using a PEEK scraper ring on the sensor socket of the Ceramat, or when retrofitting a Ceramat with sensor socket including scraper ring as accessory ZU 0705, ZU 0706, or ZU 0707 (see Accessories page 35), the proper functioning of the sensor dismount guard in combination with the Unical/Uniclean cannot be guaranteed. Buildup of contaminations can result in high stripping forces which impair the functioning of the sensor dismount guard.

NOTICE
Therefore, the operator of the Ceramat must always make sure that a sensor is installed before moving the probe to PROCESS position (measuring).

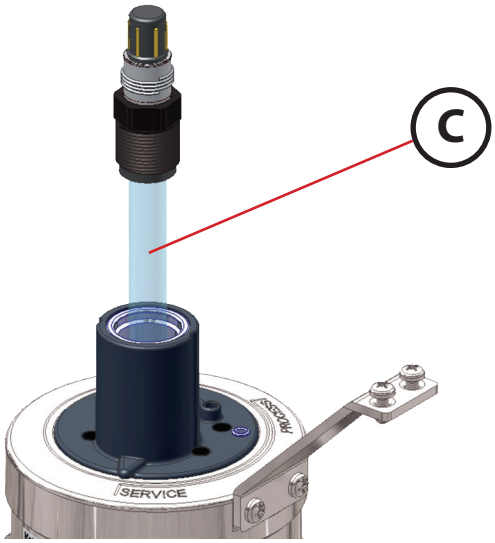
pH Sensors, Oxygen Sensors, Conductivity Sensors

ZU 0647
Tool for sensor installation



Installing the sensor

1) Move probe into SERVICE position.
   The sensor must only be installed in **SERVICE position**.
2) Use appropriate sensors **(C)** only:
   Diameter: 12-0.5 mm Length: 225 mm
   Observe pressure resistance of the sensor.
3) Before installing the sensor, check that there is no liquid flowing out of the outlet (ceramic slides or probe housing might be defective).
4) Check whether slide ring **(A)** or O-ring **(B)** on the sensor are damaged.
5) Screw in the sensor head (19 mm A/F, PG 13.5 thread) with a max. torque of 3 Nm (recommended tool: 19 mm wrench, e.g. Knick ZU 0647).
6) Install sensor cable and media connection (see “Information on Installation“ on page 13).



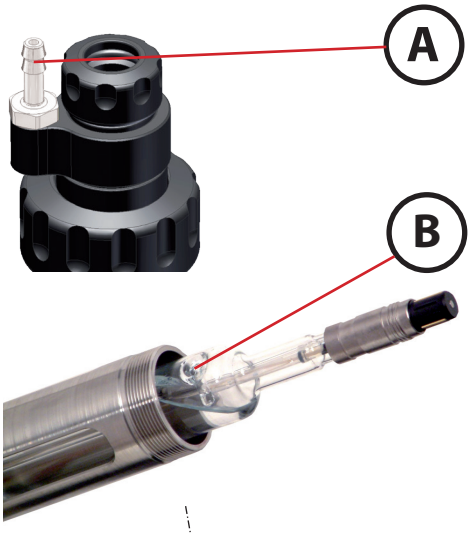
Removing the sensor:

1) Move probe into SERVICE position. The sensor must only be removed in **SERVICE position**.
2) Before removing the sensor, check that there is no liquid flowing out of the outlet (ceramic slides or probe housing might be defective).
3) Loosen the sensor plug.
4) Loosen the sensor using a suitable tool and pull it out. Be sure not to cant the sensor because it might break (recommended tool for removing the sensor:
   19 mm A/F, e.g. Knick ZU 0647 wrench).

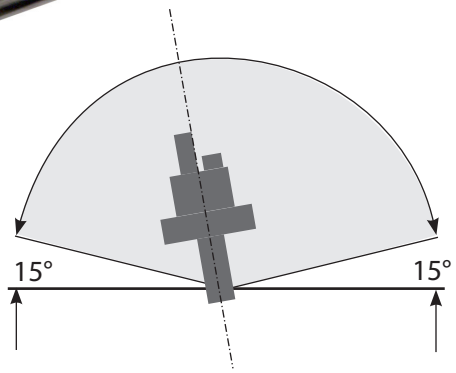
pH Sensors

You can use sensors with a length of 250 mm and an electrode diameter of 12 mm, e.g. Knick SE 551.
To ensure that the electrolyte flows from the reference electrode to the process medium, the air pressure in the sensor pressure chamber must be 0.5 to 1 bar above that of the process medium. We recommend the ZU 0670/1 or ZU 0670/2 module (see "Accessories" on page 35) to maintain the defined overpressure in the pressure chamber of the sensor.
It is connected to the sensor pressure chamber via connection nipple (NW 6 mm) **(A)**.

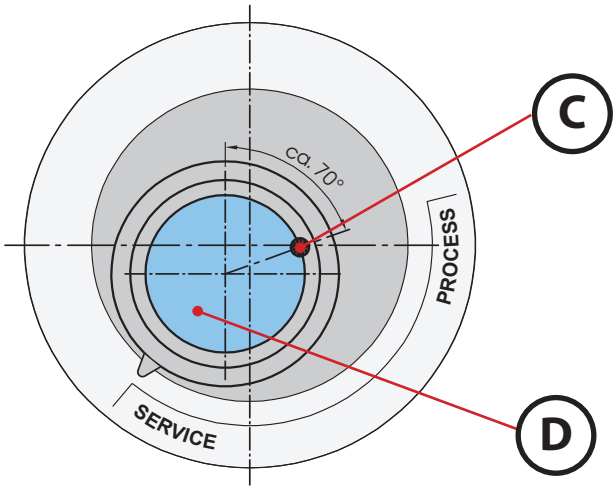
Check whether the sensor is damaged (glass broken?). Remove watering cap from the sensor tip and rinse sensor with water.



NOTICE
In the case of inclined installation, the sensor must be installed as described below to prevent electrolyte from flowing out during operation of the sensor lock-gate. First, move the sensor lock-gate into SERVICE position.

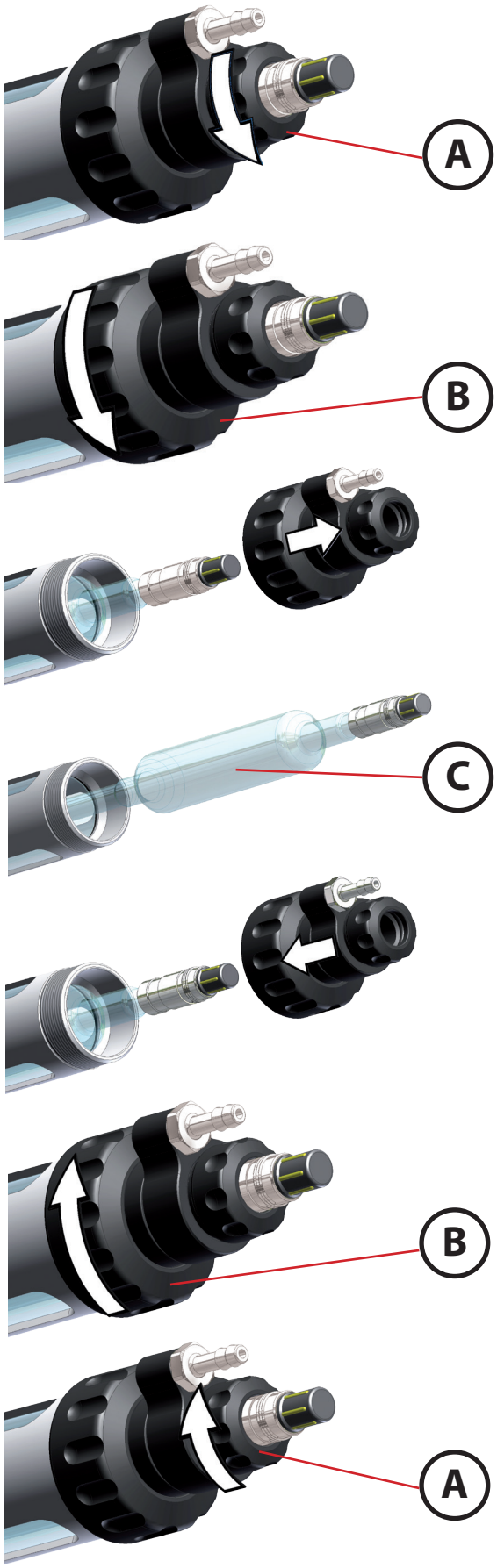


Within the permitted installation angle the probe can be positioned as desired (at least at 15°).



As the Ceramat performs a rotary movement in addition to the stroke movement, you must position the sensor **(D)** in a way that the filling hole **(B)** (e.g. Schott) or the "TOP" labeling (e.g. Mettler) **(C)** of the sensor is turned out of the vertical by approx. 70° when the sensor lock-gate is inclined (see figure).
Only this prevents electrolyte leakage during movement of the Ceramat.

22 Installing/Removing a Liquid-Electrolyte Sensor

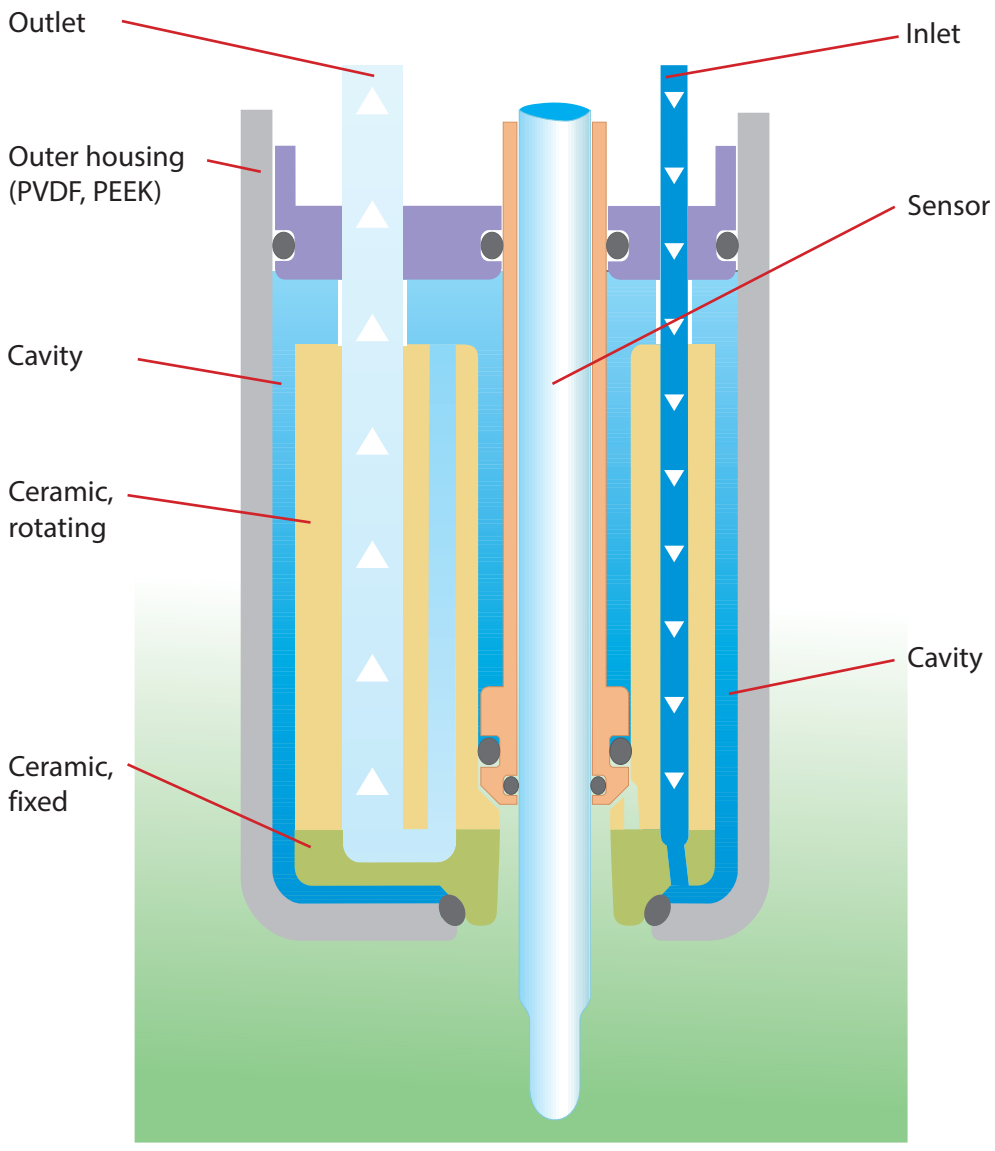


Installing or removing the sensor

1) Only install or remove the sensor when the sensor lock-gate is in SERVICE position.
2) Loosen small coupling nut **(A)** – do not remove it.
3) Unscrew large coupling nut **(B)** completely (counterclockwise).
4) Pull the detached unit upwards.
5) Install or remove sensor **(C)**.
6) Replace the unit you have detached in step 4. First hand-tighten the large coupling nut **(B)** and then the small coupling nut **(A)** (clockwise).

Cavity Rinsing Function

In SERVICE position, inlet and outlet are directly connected with the calibration chamber.
The ceramic slides are mounted in an outer housing, which is in contact with the process.
There is a risk that process fluid penetrates into the cavity between ceramic and outer housing.
Such fluids can be drained off using the cavity rinsing function. For this procedure, the inlet is rerouted to the cavities when the sensor lock-gate moves to PROCESS position. When the rinsing function is activated (e.g. by Unical), the cavities are rinsed and the fluids are drained off through the outlet.
Normally, rinsing should be performed every 8 hours for 30 seconds.
With very frequent probe movements, aggressive or sticky process media, the rinsing intervals should be accordingly reduced.



Ceramic sensor lock-gate
in PROCESS position

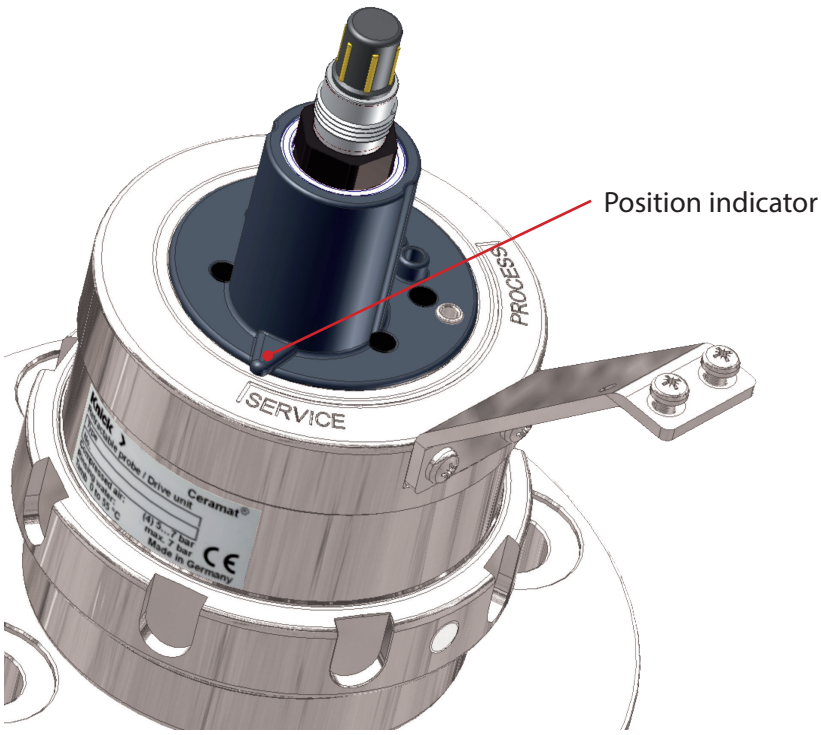
24 Maintenance Work on the Drive Unit

The drive unit must be removed, for example:

- for general maintenance or inspection
- to clean the calibration chamber, e.g. after a sensor has broken
- to change the sensor / calibration-chamber gaskets
- in the event of a technical fault of the drive unit.

NOTICE

Before working on the drive unit make sure that the sensor lock-gate is in SERVICE position. This position is attained by: the service switch (see Unical 9000(X) installation manual) or the "Maintenance" menu of the Protos 3400(X) (see user manual of PHU 3400(X)-110 module).
While working on the sensor lock-gate, other persons must be prevented from actuating the control unit.
The position indicator shows whether the sensor lock-gate is in SERVICE position.



⚠ WARNING

When the drive unit must be removed under process conditions, be sure to wear protective clothing, gloves, and goggles to protect yourself against process fluid that might escape. The drive unit serves as second barrier after the ceramic rotary slides, i.e. even after a breakage in the ceramics or a defect in the probe housing an uncontrolled escaping of process fluid is prevented. When removing the drive unit under process conditions, you must check whether the first barrier (rotary slides, probe housing) functions properly.

Removing the Drive Unit

NOTICE
Be sure to follow these instructions in the correct sequence! Take appropriate safety precautions against escaping process fluids.

ZU 0648

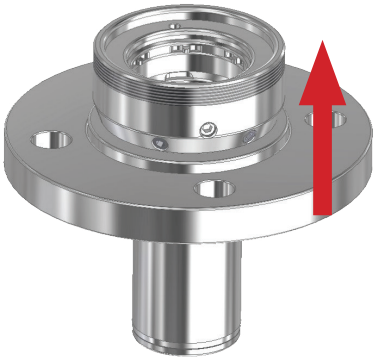
1) Move probe into SERVICE position.
   Only in this position can the drive unit be removed.

2) Switch off compressed air and deaerate device!

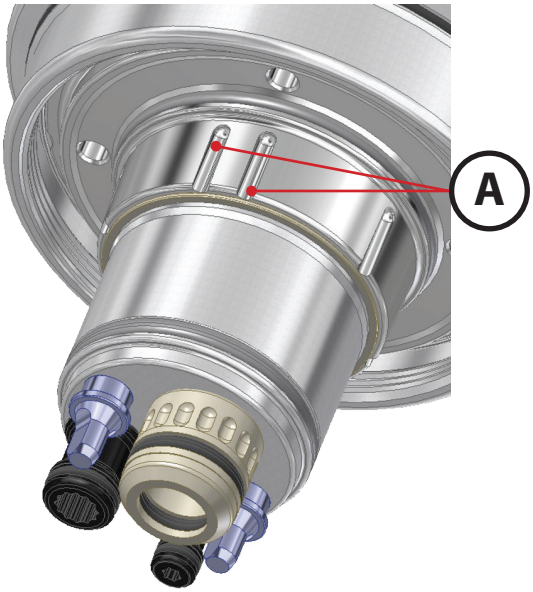
3) Make sure that no process fluid is leaking from the outlet.

4) Turn coupling nut counterclockwise using the ZU 0648 mounting wrench (see "Accessories", page 35). This pulls the drive unit out of the process unit.
   You can slightly lift up the drive unit while turning the nut to support its movement. Do not cant the unit and do not exert force. Do not loosen the coupling nut completely.

5) Make sure that no process fluid is leaking from the outlet.



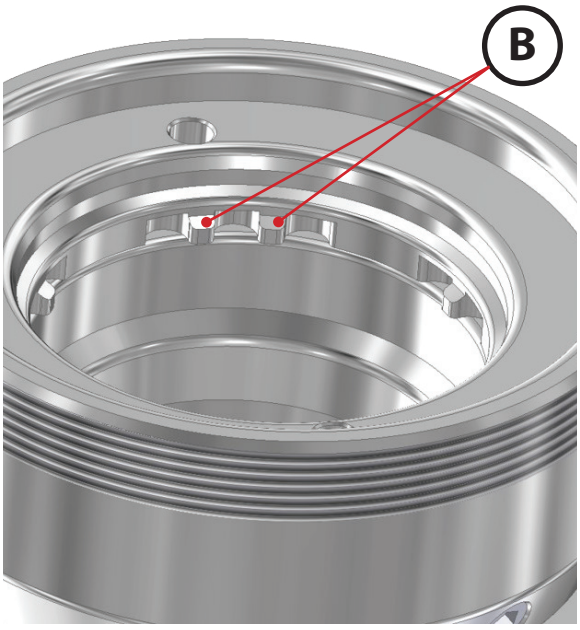
6) Completely loosen the coupling nut and pull off the drive unit upwards.



NOTICE
Be sure to follow these instructions in the correct sequence.

1) Before installing the drive unit in the process unit, check whether the drive unit is in SERVICE position. Only then can the drive unit be inserted sufficiently deep into the process unit so that the groove can engage with the coupling nut.

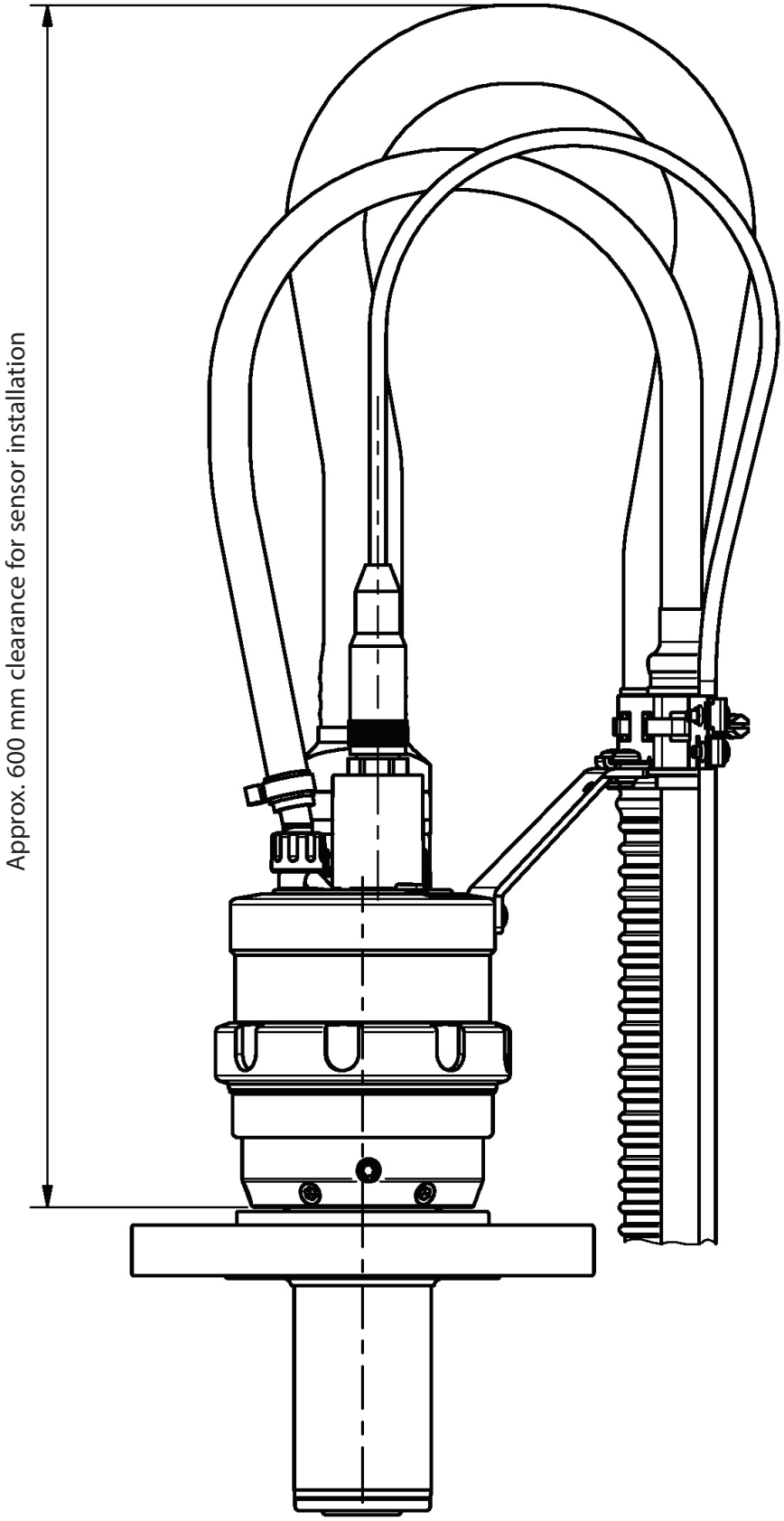
2) When mounting the drive unit to the process unit, make sure that the guiding grooves of the drive unit **(A)** engage with the guiding bars of the process unit **(B)**.



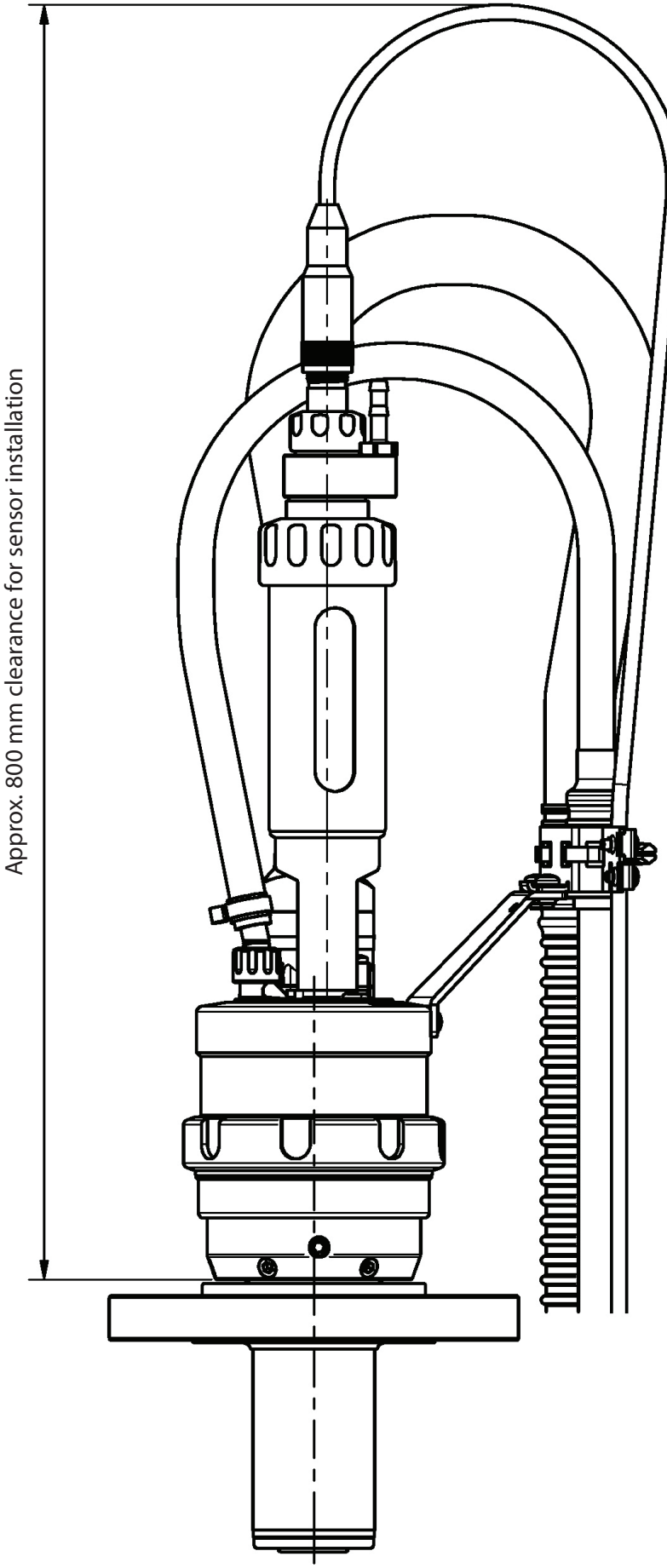
ZU 0648

3) After successful alignment, you can insert the drive unit and screw the coupling nut tight until it noticeably stops. Where required, continue to press the drive unit in while screwing the coupling nut to make screwing easier. Hand tighten the coupling nut using the ZU 0648 Ceramat mounting wrench, see “Accessories”, page 35.

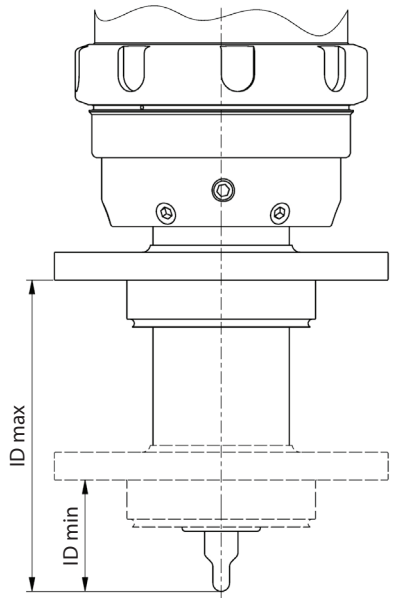
Solid Electrolyte



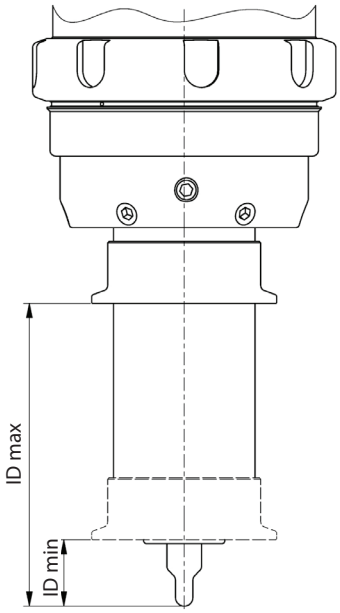
Liquid Electrolyte



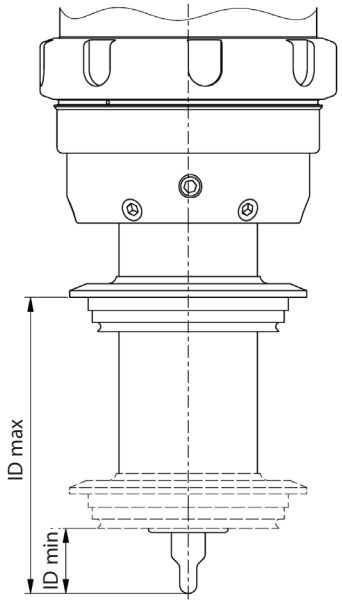
Process Adaptations and Immersion Depths (Examples)



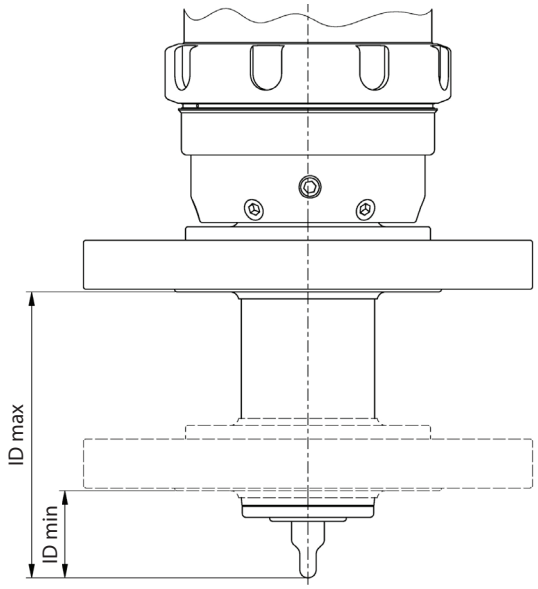
BioControl



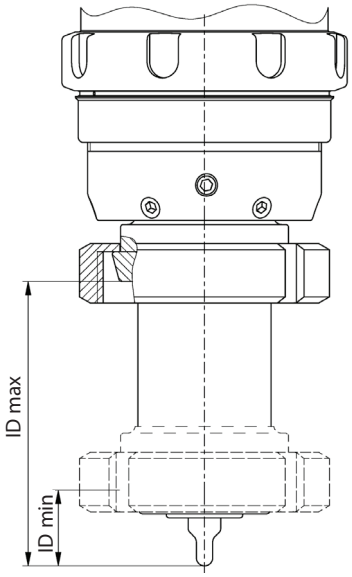
Tri-Clamp



Varivent



Flange



Dairy pipe

Process adaptation	Max. ID* in mm	Min. ID in mm
Flanges	105	32
Dairy pipe	105	28
Varivent	105	23
Tri-Clamp 2“	105	23
BioControl DN65	105	40

*) ID = immersion depth

Permissible process pressure and temperature during movement	10 bar (up to 140 °C)
Permissible process pressure and temperature, statically in SERVICE position	16 bar (at 0 ... 40 °C)
Ambient temperature	-10 ... 70 °C
Ingress protection	IP 66
Permissible pressure for probe control	4 ... 7 bar *
Quality of compressed air	
Standard	acc. to ISO 8573-1:2001
Quality class	3.3.3 or 3.4.3
Solid contaminants	3 (max. 5 µm, max. 5 mg/m^3)
Water content for temperatures ≥ 15 °C	Class 4, pressure dew point 3 °C or below
Water content for temperatures 5 ... 15 °C	Class 3, pressure dew point -20 °C or below
Oil content	Class 3 (max. 1 mg/m^3)
Sensors	
with solid electrolyte	Ø12 mm, length 225 mm with temp detector, PG 13.5 thread
with liquid electrolyte	Ø12 mm, length 250 mm with temp detector
Optical sensors	Ø 12 mm, Ø 12.7 mm (1/2")
Process adaptations	See product coding
Connections	
Outlet	Socket for Unical media hose
for pressurized sensors	Hose connection NW 6 Pressure in sensor chamber 0.5 … 1 bar above process pressure (max. 7 bar)
for compressed air, rinse and calibration media (control air for retractable fitting)	for Unical multiplug
Immersion depths / Dimensions	See dimension drawings
Process-wetted materials	See product coding

* Control pressure required for process pressure

Control pressure (bar)	Process pressure (bar)
5	7
6	8
7	10

Maintenance Intervals

Because of the highly variable process conditions (pressure, temperature, chemically aggressive media etc.), general information on necessary maintenance intervals is difficult to provide. If proven experience has been gained from similar points of measurement with regard to materials used and their resistance unter process conditions, the maintenance intervals can be adjusted by the customer. If previous experience is positive, parts of the first inspection may be omitted.

The following maintenance intervals are generally recommended:

Maintenance interval*	**Operations required**
First inspection after a few weeks	Move the probe to the PROCESS position and observe the outlet. If the sensor lock-gate is not tight, process fluid will leak from the outlet hose. Move the probe to the SERVICE position. Remove the drive unit (no process interruption necessary). To do so, see "Maintenance Work on the Drive Unit" on page 24. Visually inspect the O-rings to check the general suitability of the material used under the present process conditions.
After 1-2 years or 30,000 cycles (after successful first inspection and suitability of all materials used, this time period may be extended.)	Check/replace the dynamically loaded O-ring on the sensor socket, check the statically loaded O-rings without process interruption. Where required, examine the cavity rinsing. If deposits or chemical attacks on the probe housing are suspected (visible in the probe housing after removing the drive unit), check the process unit.
After 10 years or 500,000 cycles	Complete maintenance at the factory with replacement of pneumatic sealings, lubricants, and check of all functions, pressure test, leak test

*) These maintenance intervals are rough recommendations. The actual intervals depend on the application of the sensor lock-gate.

For fittings used in the chemical industry, the lubricant Syntheso Glep1 (silicone-free) is applied.
For fittings used in the pharmaceutical / food industry (when FDA conformity is required), the lubricant Beruglide L (silicone-free) is applied (registered according to NSF-H1).
On request, the lubricant Paraliq GTE 703 can be applied (excellent lubricating properties also at increased temperatures and for a large number of stroke movements). This lubricant contains silicone and is only used as special application on specific request.

Application	Pharma / Food		Chemistry / Wastewater
Lubricant	Beruglide L (silicone-free) FDA-conforming NSF-H1-registered	Paraliq GTE 703 (containing silicone) FDA-conforming (USDA H1)	Syntheso Glep 1 (silicone-free)
Materials of O-rings (elastomeric gaskets)			
FKM	X	X	X
FFKM	X	X	X
EPDM	X	X	X

Sealing Kits for Maintenance and Servicing

The sealing kits are available in different materials.
The new O-rings must be lubricated with the included lubricant.

The following sealing kits are available for repair and servicing:

Sealing kit	Process-wetted / rinse-wetted sealings	Order no.	Suitable lubricant (included)
Set A	FKM / FKM	On request	Syntheso Glep1
Set B	EPDM / EPDM	On request	Syntheso Glep1
Set E	EPDM FDA / EPDM FDA	On request	Beruglide L
Set F	FKM FDA / FKM FDA	On request	Beruglide L
Set H	FFKM FDA / FFKM FDA	On request	Beruglide L
Set K	FFKM / FFKM	On request	Syntheso Glep1

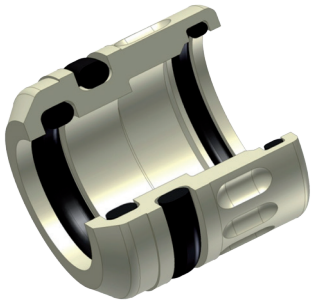
Zubehör / Ersatzteile	Bestell-Nr.
Sensor-Montageschlüssel SW 19	ZU 0647
Luftversorgung für druckbeaufschlagte Sensoren 0,5-4 bar	ZU 0670/1
Luftversorgung für druckbeaufschlagte Sensoren 1-7 bar	ZU 0670/2
Montageschlüssel Ceramat	ZU 0648
pneumatisches Handsteuerventil	ZU 0646
Standard-Medien (SM)-Interface	ZU 0631
pneumatisch gesteuertes 3/8“-Ventil für Zusatzmedium	ZU 0669
Adapter für Zusatzmedium PEEK/FKM	ZU 0654/1
Adapter für Zusatzmedium PEEK/EPDM	ZU 0654/2
Adapter für Zusatzmedium PEEK/FFKM	ZU 0654/3
Adapter für Zusatzmedium Stahl/FKM	ZU 0655/1
Adapter für Zusatzmedium Stahl/EPDM	ZU 0655/2
Adapter für Zusatzmedium Stahl/FFKM	ZU 0655/3
Sensorbuchse Ceramat PEEK/FKM	ZU 0616
Sensorbuchse Ceramat PEEK/EPDM	ZU 0617
Sensorbuchse Ceramat PEEK/FFKM	ZU 0618
Sensorbuchse Ceramat PEEK/EPDM-FDA	ZU 0619
Sensorbuchse Ceramat PVDF/FKM	ZU 0620
Sensorbuchse Ceramat PVDF/EPDM	ZU 0621
Sensorbuchse Ceramat PVDF/FFKM	ZU 0622
Sensorbuchse Ceramat PVDF/EPDM-FDA	ZU 0623
Sensorbuchse lang Stahl 1.4571/FKM	ZU 0672/A
Sensorbuchse lang Stahl 1.4571/EPDM	ZU 0672/B
Sensorbuchse lang Stahl 1.4571/FFKM	ZU 0672/C
Sensorbuchse lang Stahl Hastelloy C22/FKM	ZU 0673/A
Sensorbuchse lang Stahl Hastelloy C22/EPDM	ZU 0673/B
Sensorbuchse lang Stahl Hastelloy C22/FFKM	ZU 0673/C
Sensorbuchse Vollschutz Stahl 1.4571/FKM	ZU 0808/A
Sensorbuchse Vollschutz Stahl 1.4571/EPDM	ZU 0808/B
Sensorbuchse Vollschutz Stahl 1.4571/FFKM	ZU 0808/C
Sensorbuchse Vollschutz Hastelloy/FKM	ZU 0820/A
Sensorbuchse Vollschutz Hastelloy/EPDM	ZU 0820/B
Sensorbuchse Vollschutz Hastelloy/FFKM	ZU 0820/C
Sensorbuchse PEEK/FKM (mit Abstreifring)	ZU 0705
Sensorbuchse PEEK/EPDM (mit Abstreifring)	ZU 0706
Sensorbuchse PEEK/FFKM (mit Abstreifring)	ZU 0707

ZU 0647
Sensor-Montageschlüssel SW 19

Dient zum sicheren Einschrauben des Sensors, ohne das Kunststoffgewinde des Sensorkopfes PG 13,5 durch zu starkes Anziehmoment (z. B. Maulschlüssel) zu überlasten.

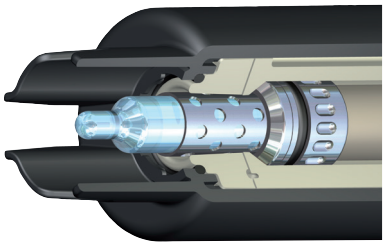
ZU 0648
Montageschlüssel Ceramat

Dient zum Trennen und Montieren des Antriebs von der Prozesseinheit über die Überwurfmutter des Antriebs.

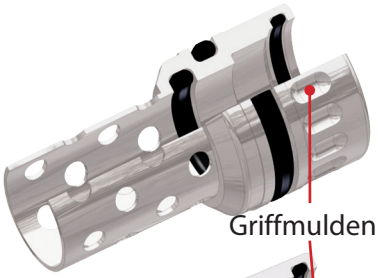


Sensorbuchse mit montierten O-Ringen

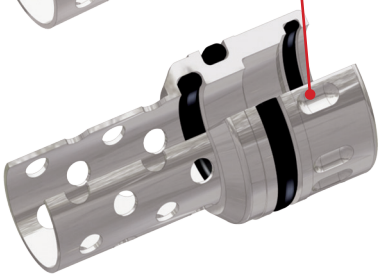
- **ZU 0616** Sensorbuchse PEEK, O-Ringe FKM
- **ZU 0617** Sensorbuchse PEEK, O-Ringe EPDM
- **ZU 0618** Sensorbuchse PEEK, O-Ringe FFKM
- **ZU 0619** Sensorbuchse PEEK, O-Ringe EPDM FDA
- **ZU 0620** Sensorbuchse PVDF, O-Ringe FKM
- **ZU 0621** Sensorbuchse PVDF, O-Ringe EPDM
- **ZU 0622** Sensorbuchse PVDF, O-Ringe FFKM
- **ZU 0623** Sensorbuchse PVDF, O-Ringe EPDM FDA



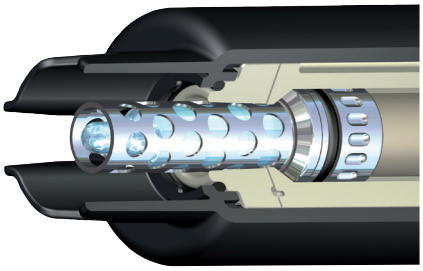
Sensorbuchse, lang mit montierten O-Ringen
Diese Sensorbuchse wird bei spröden Verkrustungen (z.B. Kalk) empfohlen.
(Werkstoff Hastelloy C22 erkennbar an einer fehlenden Griffmulde)



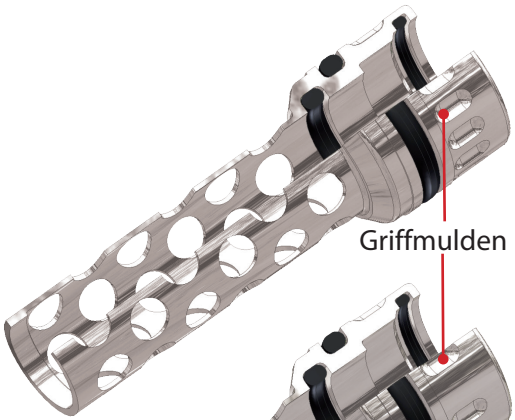
- **ZU 0672/A** Sensorbuchse 1.4571, O-Ringe FKM
- **ZU 0672/B** Sensorbuchse 1.4571, O-Ringe EPDM
- **ZU 0672/C** Sensorbuchse 1.4571, O-Ringe FFKM



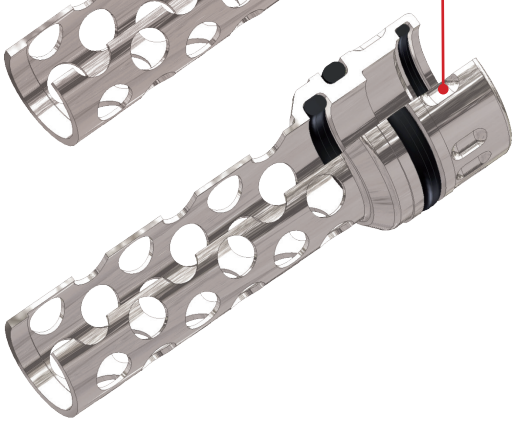
- **ZU 0673/A** Sensorbuchse Hastelloy, O-Ringe FKM
- **ZU 0673/B** Sensorbuchse Hastelloy, O-Ringe EPDM
- **ZU 0673/C** Sensorbuchse Hastelloy, O-Ringe FFKM



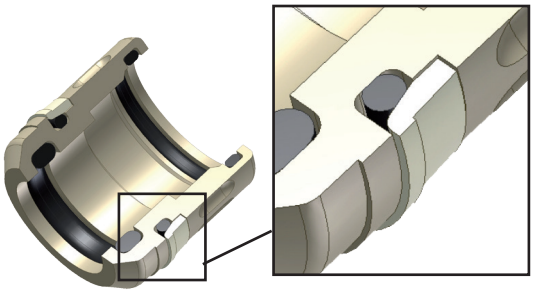
Sensorbuchse, Sensorvollschutz mit montierten O-Ringen
Diese Sensorbuchse wird bei spröden Verkrustungen (z.B. Kalk) empfohlen. Zusätzlich wird der Sensor mechanisch besser geschützt.
(Werkstoff Hastelloy C22 erkennbar an einer fehlenden Griffmulde)



- **ZU 0808/A** Sensorbuchse 1.4571, O-Ringe FKM
- **ZU 0808/B** Sensorbuchse 1.4571, O-Ringe EPDM
- **ZU 0808/C** Sensorbuchse 1.4571, O-Ringe FFKM



- **ZU 0820/A** Sensorbuchse Hastelloy, O-Ringe FKM
- **ZU 0820/B** Sensorbuchse Hastelloy, O-Ringe EPDM
- **ZU 0820/C** Sensorbuchse Hastelloy, O-Ringe FFKM



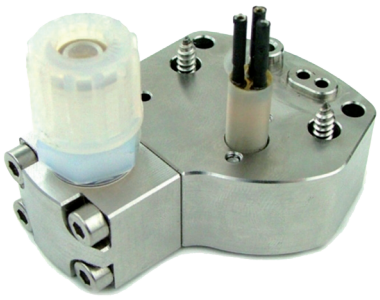
Sensorbuchse mit montierten O-Ringen und Abstreifring mit Abstreifkante aus PEEK
Diese Sensorbuchse wird bei anhaftenden oder klebrigen Medien sowie bei Partikeln im Prozessmedium empfohlen
Bitte Hinweis auf Seite 19 beachten.

- **ZU 0705** Sensorbuchse PEEK, O-Ringe FKM
- **ZU 0706** Sensorbuchse PEEK, O-Ringe EPDM
- **ZU 0707** Sensorbuchse PEEK, O-Ringe FFKM

ZU 0670/1
Luftversorgung für druckbeaufschlagte Sensoren 0,5 - 4 bar

ZU 0670/2
Luftversorgung für druckbeaufschlagte Sensoren 1 - 7 bar

Diese Baugruppen dienen zum Aufrechterhalten des definierten Überdrucks in der Druckkammer des Sensors.



Adapter für Zusatzmedium
Dieser Adapter ermöglicht das Einleiten eines zusätzlichen Spülmediums außerhalb des vorhandenen Medienanschlusses (Medienschlauches).
Er wird zwischen der Ceramat und dem Multistecker des Medienschlauches montiert.
Folgende Ausführungen sind lieferbar:

- **ZU 0654/1** Adapter aus PEEK, O-Ringe FKM
- **ZU 0654/2** Adapter aus PEEK, O-Ringe EPDM
- **ZU 0654/3** Adapter aus PEEK, O-Ringe FFKM
- **ZU 0655/1** Adapter aus 1.4571, O-Ringe FKM
- **ZU 0655/2** Adapter aus 1.4571, O-Ringe EPDM
- **ZU 0655/3** Adapter aus 1.4571, O-Ringe FFKM

Standard-Medieninterface ZU 0631
Anschluss-Set für Sensorschleusen zum manuellen Betrieb (vgl. ZU 0646) oder zum Betrieb an einer SPS.

Pneumatisches Handsteuerventil ZU 0646
Schalter zum manuellen Betrieb (Kippschalter zum Umsteuern der Druckluft) am Standard-Medieninterface ZU 0631.

Declaration of Contamination

39

Knick

Return Form

Declaration of potential hazards in the enclosed products from exposure to chemicals

We can only accept and carry out the service order if this declaration is filled out completely.
Please include it with the shipping documents.

If you have any questions, please contact our repairs department in Berlin.

RMA number (can be obtained by calling +49 30 80 191-233): .....

Customer information (must be completed if no RMA no. available):

Company: .....

Address: .....

Contact: ..... Tel./E-mail: .....

Information on the product:

Product name: .....

Serial number: .....

Included accessories: .....

.....

☐ The product being returned is new/unused or
has not been exposed to hazardous substances.

☐ The product has been exposed to hazardous substances.

Please preferably state the classification of the hazardous substance, as applicable together with the H-phrases (or R-phrases), or at minimum provide the relevant hazard pictograms:

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

☐ The product has been exposed to infectious substances.

☐ The product was subjected to suitable cleaning procedures
to prevent exposure to hazards prior to return.

☐ The product was not freed of hazardous substances prior to return.

I have answered the above questions to the best of my knowledge.

Name: ..... Company: .....

Date: ..... Signature: .....

Knick Elektronische Messgeräte GmbH & Co. KG, Beuckestr. 22, 14163 Berlin, Germany
Phone +49 (0) 30 801 91 - 0 / Fax +49 (0) 30 801 91-200
E-mail: knick@knick.de / Internet: www.knick.de

A
Accessories 34
Adapter for additional medium 38
Adjustment 10
Air supply for pressurized sensors, ZU 0670 37
Ambient temperature 30

C
Calibration 10
Calibration chamber 23
Calibration media 13
Cavity rinsing 23
Ceramic slides 23
Composition of the sensor lock-gate 11
Connecting the multiplug 16
Connecting the outlet hose 15
Connection to Unical or Uniclean 17
Control air 13
Control pressure 30

D
Declaration of Contamination 39
Drive unit, description 11
Drive unit, installation 26
Drive unit, removal 24

E
Electrical check-back 13
Equipotential bonding cable 15

F
Function description 10

G
Gaskets, material 32
Grease 32

H
Hazardous-area application 5
Hose connection 13

I
Immersion depths 29
Installation 13
Installation angle 10
Installation dimensions 27
Installing/removing a sensor 18
Installing the drive unit 26
Installing the outlet hose 14
Intended use 5

L
Lubricants 32

M
Maintenance, drive unit 24
Maintenance interval 31
Maintenance, lubricants 32
Maintenance, operations required 31
Maintenance, sealing kits 33
Media adapter, connection 17
Media connection, description 13
Media connection to Ceramat 16
Media connection to Unical or Uniclean 17
Media connection, variants 17
Mounting angle 10
Mounting wrench for Ceramat, ZU 0648 35
Multiplug 17
Multiplug, connection 16

O
Optical sensors 5
O-rings, material 32
Outlet hose, installation 14, 15
Overview 11

P
Package contents 7
Pneumatic manual control valve, ZU 0646 38
Process adaptations 29
Process conditions 31
PROCESS position 10
Process pressure 30
Process unit, description 11
Product coding 8, 9

R
Rating plates 6
Removing a sensor 18
Removing the drive unit 24
Repair, sealing kits 33

S
Safety information 3
Scraper ring and sensor dismount guard 19
Sealing kits 33
Sealing rings, material 32
Sensor cable, connection 15
Sensor connection 18
Sensor dismount guard 19

Sensor mounting wrench, ZU 0647 35
Sensor preparation 19
Sensor sockets 35
Sensor with liquid electrolyte 21
Sensor with liquid electrolyte, dimensions 28
Sensor with solid electrolyte 20
Sensor with solid electrolyte, dimensions 27
SERVICE position 10
Servicing, sealing kits 33
Spare parts 34
Specifications 30
Standard media interface, installation 16
Standard-media interface, ZU 0631 38
Supply lines 13

T

Technical data 30
Trademarks 2

Knick
Elektronische Messgeräte GmbH & Co. KG
Beuckestraße 22
14163 Berlin

Tel.: +49 (0)30 - 801 91 - 0
Fax: +49 (0)30 - 801 91 - 200
Internet: www.knick.de
Email: knick@knick.de

CE

088222

TA-203.100-KNE01

20140606